Space Weather Forecast

Issued on Wednesday, 05 July 2023 at 13:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: R1/R2 Radio Blackouts likely. G1/Minor Storm to G2/Moderate Storm possible late 06 July or early 07 July with CME arrival.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Moderate, with a single Moderate-class flare originating from the largest and most magnetically complex sunspot region, which is close to the northwest limb and which is becoming difficult to analyse. This is one of eight sunspot regions on the visible disc, with one region on the northeast and one on the south-central disc showing modest growth. The remaining regions are either weak or benign. No Earth directed CMEs have been observed on available imagery in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind has been at background levels. The Interplanetary Magnetic Field was weak throughout, while the north-south component also varying weakly. Geomagnetic activity was Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Moderate activity is likely, with a slight chance of further Strong flares. The risk is mostly coming from a large and complex region on the northwest limb. As this region rotates across the limb, the risk falls slightly, but still presents a flare risk from beyond the limb.

Solar Wind / Geomagnetic Activity: A CME from the southeast of the disc on 04 July has been analysed and appears to be Earth-directed, with a likely to arrival at Earth either late on the 06 or early on 07 July. Solar wind speeds may increase from ambient levels to elevated due to the possible arrival fast wind source. Depending on the timing of arrival of the CME may mask this connection and produce solar wind speeds of up to 700km/s. Geomagnetic activity is forecast to be mainly Quiet at first, but increasing to Active with a risk of G1 or G2 (Minor or Moderate) storms due to the effects of the CME arrival either late on 06 July or during 07 July or connection with the fast solar wind on 07 July. There is also a very slight chance of G3 Strong storms, but with low confidence. Heightened geomagnetic activity is then expected to the end of the period following either of these events.

Energetic Particles / Solar Radiation: Solar radiation has a slight but declining chance of reaching the S1/Minor Storm threshold throughout the period, mainly from the large region in the northwest. The risk reduces as this rotates away from the visible disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	40	60	30
Strong	G3	No	1	5	10	5
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	40	20
Very Active	R3 to R5 X	No	10	10	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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